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Understanding the Truth about Subjectivity

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## Abstract

Results of two experiments show children's understanding of diversity in personal preference is incomplete. Despite acknowledging diversity, in Experiment 1 (N=108), 6- and 8-year-old children were less likely than adults to see preference as a legitimate basis for personal tastes and more likely to say a single truth could be found about a matter of taste. In Experiment 2 (N=96), 7- and 9-year-olds were less likely than 11- and 13-year-olds to say a dispute about a matter of preference might not be resolved. These data suggest that acceptance of the possibility of diversity does not indicate an adult-like understanding of subjectivity. An understanding of the relative emphasis placed on objective and subjective factors in different contexts continues to develop into adolescence.

Diversity, Personal preference, Subjectivity, Epistemology.

### Understanding the truth about subjectivity.

Many of the most interesting and challenging problems people face in their everyday lives involve reconciling different viewpoints. Sometimes differences might be settled by uncovering an agreed truth of the matter, but on other occasions a single true answer will be unavailable or inappropriate. For issues such as this, successful resolution can depend upon interested parties acknowledging the possibility and legitimacy of different perspectives and recognising how subjective factors such as personal beliefs, motivations, or preferences influence people's judgments about what is true or correct.

Kuhn (2000) proposed that individuals' ability to deal constructively with this kind of ill-defined problem rests upon the extent to which they understand and coordinate the relationship between objective and subjective aspects of the knowing process. Initially, research carried out to look at epistemological development suggested that: *i)* the emphasis someone places on objective or subjective factors is determined by their underlying understanding of the nature of knowledge; *ii)* this understanding will influence the individual's judgments across all knowledge domains, and; *iii)* individuals' thinking about the nature of knowledge progresses through a series of age-related stages. Typically, understanding develops from emphasising objectivity in early childhood, where all differences in belief are expected to be reconciled by reference to a true state of affairs (an 'absolutist' epistemic stance), to a later emphasis upon subjectivity, where differences are treated as equally valid opinions (a 'relativist' or 'multiplist' stance). Finally (albeit less commonly), there is a further shift in adulthood to taking an

‘evaluativist’ or ‘rationalist’ stance in which different beliefs are assessed in relation to the context in which they arise (see reviews by Hofer & Pintrich, 1997; Pintrich, 2002).

More recently, these assumptions have been challenged by research highlighting domain specificity in epistemic thinking (Estes, Chandler, Horvath, & Backus, 2003; Hofer, 2000; Paulsen & Wells, 1998) and suggesting that the ‘objective to subjective’ shift occurs earlier in some knowledge domains than in others (Kuhn, Cheney, & Weinstock, 2000). One implication of domain specificity in epistemic thinking, is that individuals need to be aware of the appropriate emphasis to place on objective or subjective factors in different contexts. Currently there is uncertainty about when and to what extent children begin to discriminate in their approach to different types of issues.

In the two experiments presented here we examine children’s judgments about the relative importance of personal preference and factual information in different contexts. We also probe their understanding of the nature of subjectivity, at least as it is construed in Western society. In recent years a body of research has emerged to suggest that people from East and South Asian cultures are more likely to explain behaviours in terms of situational variables, especially when situational constraints are salient (Choi, Nisbett, & Norenzayan, 1999). In contrast, in the West there is a tendency to refer to enduring personal dispositions (Ross & Nisbett, 1991). Here we are interested in how children’s understanding compares with that we would expect to see in Western adults, and how this understanding develops during middle and late childhood. Even in the West, however, the border between what counts as an objective or subjective matter is disputed territory. In order to examine children’s understanding of subjectivity we focus upon issues and beliefs based upon personal preferences and tastes. In doing so we conform to the

position taken by a number of philosophers (e.g. Searle, 1992), that something qualifies as being (epistemologically) subjective if the most important evidence for determining the truth-value of statements relating to it is derived from (metaphysically subjective) personal experience (e.g. how something tastes *to me* but not necessarily anyone else). By concentrating on subjectivity in terms of simple matters of preference or taste we also aim to present our child participants with issues that give them every chance of demonstrating their ability to discriminate in their judgments from matters of fact.

Even before assessing the merits of different beliefs, however, children first need to acknowledge that it can be legitimate for diverse views to be held. Again, an important distinction can be made between children's understanding of differences in beliefs originating externally in the current situation and those occurring as a result of pre-existing individual differences, such as personal preferences or tastes (Miller, 2000). For example, even 3-year-olds are more ready to accept diversity for matters of taste than for matters of fact. Flavell, Flavell, Green, and Moses (1990) report that 3-year-olds were ready to acknowledge, for example, that "Ellie doesn't think this is a yummiestasting cookie" when they themselves thought it was. At the same time, the children were unwilling to acknowledge "Ellie doesn't think there's candy inside the box" when they themselves thought otherwise.

By around the age of 4 to 5 years many children are willing to acknowledge false beliefs (Wellman, Cross, & Watson, 2001). Importantly, however, in the case of false belief the protagonist lacks crucial information which is available to the child participant, in this example the content of the candy box. In contrast, in the case of the cookie, the 3-year-old participants and Ellie had tasted the cookie and so were drawing on the very

same experience. It is not until around the age of 7 years or even older that children acknowledge diversity of views when both parties have the same (limited) access to information about a matter of fact. For example, Carpendale and Chandler (1996) compared children's acceptance of and explanations for diverse views about matters of personal taste and about the interpretation of limited information. They told children aged 5-6 and 7-8 years about two protagonists who disagreed about whether a bowl of soup tasted good or bad. Children also heard an ambiguous message about where a coin was hidden, and were told that two protagonists made different interpretations of the message. Children were invited to explain why the protagonists had different views, and were asked whether they could predict what another person would think. Carpendale and Chandler's (1996) results suggested that children's understanding of matters of taste is well in advance of their understanding about alternative interpretations of ambiguous input, and these authors argue that understanding about pre-existing differences in personal taste should be viewed separately from an understanding about interpretation.

Kuhn, Cheney, and Weinstock (2000) also concluded that children aged 7 and 8 years have no difficulty understanding diversity of views for matters of taste. In two studies, participants ranging in age from 7 years to 'mature adults' were asked to judge the legitimacy of competing viewpoints in the contexts of personal taste, aesthetics, values, and social and physical truth. For matters of taste, nearly all participants at all ages judged that both views 'could have some rightness' and that one was 'not more right than the other'. Kuhn et al. interpret these responses amongst their 7- and 8-year-olds as evidence of early relativistic thinking for matters of taste.

Wainryb, Shaw, Langley, Cottam, and Lewis (2004) also compared children's judgments about diversity for matters of taste and factual matters involving limited information. These researchers examined the extent to which 5- to 9-year-olds accepted a viewpoint different from their own (tolerance) and acknowledged the possibility of equally legitimate alternative beliefs (relativism). For judgments about matters of morality (whether it is all right to kick someone) and physical facts (whether a pencil will fall up or down if dropped), children were much more likely to judge that only one belief could be right. On the other hand, for matters of taste and ambiguous fact acceptance of diversity (relativism judgments) increased with age. This fits with the finding that 7 and 8 year olds distinguish between taste and matters of physical truth (Kuhn et al., 2000) and draws attention to the fact that children's judgments about the possibility of diversity may be informed by their awareness of how truth impinges upon the matter in question.

However, acknowledging the *current* legitimacy of diverse tastes does not necessarily imply accepting that there is no single truth to be discovered. Diversity in matters of taste might be treated like diversity in interpretation of limited information about an aspect of the physical world: With more information, everybody would be expected to agree on the truth of the matter. Wainryb et al. (2004) report that 5-year-olds gave reasons that suggested they were more likely to see truth as being relevant to matters of taste than did older children. In line with this suggestion, Clinchy and Mansfield (1985) report a "large minority" of 7-year-olds who acknowledged that disputes about matters of taste are caused by internal subjective factors but who still believed a single true solution to the problem could be found. This kind of response suggests a very different understanding of matters of taste from that we would expect of most adults.



While philosophers of mind have disputed whether it is possible for two people to disagree without either being at fault ('faultless disagreement,' e.g. Kolbel, 2003), we suggest that in Western society most adults see personal tastes as being true of the individual rather than true or false in an absolute sense.

It seems clear from the published literature that by the age of 7 or 8 years, if not well before, many children acknowledge that people with the same experience can hold different views both about matters of personal taste, and about matters of fact when information is currently limited. It remains unclear, however, what lies behind such acceptance in terms of assumptions about the role of objective and subjective factors in producing and maintaining diverse views. This question is the focus of our attention in the Experiments reported below. In Experiment 1 we checked on the validity of our intuitions about adults' views about the balance of objective and subjective factors in the construction of factual beliefs and preferences, and the extent to which they believed a true conclusion could be reached. We compared adults' responses with those of 6- and 8-year-olds. In Experiment 2, we examined the views of 7-, 9-, 11- and 13-year-olds.

### Experiment 1

We presented two stories in which protagonists held diverse beliefs about a matter of fact or a matter of personal taste. Sometimes the reasons for the beliefs held by both disputing parties were relevant to the context of the dispute ('pure' disputes). In other versions of the stories one protagonist held a belief on the basis of reasons that were less relevant. For example, for a matter of fact one protagonist's belief was based on personal preference ('contaminated' disputes). For each story type, we assessed the relative weight participants placed upon preference or fact as an appropriate basis for beliefs. We also

checked whether they thought it was legitimate for diverse views to be held, and whether the truth of the matter could be found. For the two simple issues presented we expected adults would agree that for matters of fact: *i*) It is most appropriate for beliefs to be based upon the most recent available factual information; *ii*) diverse beliefs can be legitimate when available information is insufficient to expose the truth, and; *iii*) a single truth can at least in principle be found. For matters of preference we expected adults would agree that: *i*) It is more appropriate for beliefs to be based upon personal preference and that an individual's personal preference is valid for themselves but not necessarily for anyone else; *ii*) diverse beliefs are legitimate because people have different internal tastes and preferences and; *iii*) no single external truth may exist. We used the views given by a group of adult participants as a benchmark against which we compared the judgments of 6- and 8-year-old children.

### *Method*

*Participants.* The final sample consisted of 103 participants. The adult group (Mean age 29;2: Range 19-44) comprised 24 females and 12 males enrolled on a course 'Returning to Education' at a College of Further Education in Staffordshire, UK. This course was for adults without post-16 academic qualifications. Children were from a state funded junior school in Stafford, UK. In the older group there were 24 females, 10 males (Mean 8;00: Range 7;9-8;8) and in the younger group 17 females and 16 males (Mean 6;5: Range 5;11-6;9). All participants spoke English as their first language and parental agreement was sought prior to the children's participation. The responses of five further participants (three 6-year-olds and two 8-year-olds) were omitted from all analyses because they appeared to misinterpret aspects of the stories.

*Procedure.* Participants were presented with two stories, Mouse (fact-based) and Biscuit (preference-based) with order of presentation counterbalanced between participants. In the Mouse story, at a pet shop a mouse had been put into either a red or blue box but its true location was unknown. In the Biscuit story, a new biscuit was being sold in the shops. Child participants were tested individually and oral presentation of the story was supported with colour drawings showing the protagonists either in the pet shop or with a poster advertising the new biscuit. The adults received the same stories and test questions in the format of a written questionnaire.

In each story a first protagonist was introduced as holding a specific belief about the event presented in the story. The reason for this protagonist's belief was either fact- or preference-based, as follows: Mouse: "He thinks the mouse is in the red box because..." either, "He saw the mouse being put in the red box" (fact-based), or "He likes the colour red" (preference-based). Biscuit: "He thinks the biscuit is horrible because..." either "He doesn't like the taste of those biscuits" (preference-based), or "He heard on the news that this year fewer of those biscuits have been sold than any other biscuit" (fact-based). A second protagonist was then introduced, who always held the opposite belief to the first, either "The mouse is in the blue box" or "The biscuit is nice." Protagonist 2 told the first protagonist the reason for this belief. The reason was either fact- or preference-based, as follows: Mouse: "He thinks the mouse is in the blue box because..." either, "He saw the mouse being moved to the blue box" (fact-based), or "He likes the colour blue" (preference-based). Biscuit: "He thinks the biscuit is nice because..." either "He likes the taste of those biscuits" (preference-based), or "He heard on the news that this year more of those biscuits have been sold than any other biscuit" (fact-based). The reasons for the

beliefs held by the two protagonists were varied between participants so that for each story three different combinations of reasons were presented to an equal number of participants. One combination represented a ‘pure’ dispute, in which both disputants’ beliefs were based upon context-appropriate reasons: Mouse: fact-based then new fact-based; Biscuit: preference-based then new preference-based. The two other disputes were ‘contaminated’ by one of the disputants holding a belief based upon reasons that were less appropriate to the context: Mouse: fact-based then preference based; or preference-based then fact-based: Biscuit: preference-based then fact-based; fact-based then preference based.

To assess the relative weight participants placed on the beliefs held in each dispute they were asked two questions. After hearing the reasons for the first protagonist’s belief participants were asked the Validity question. For children a pointer was used: “Use the pointer to show me how good this reason is for thinking (the mouse is in the red box)”. They were asked to select between six possible responses (0 = Not sure, 1 = Very bad reason, 2 = Bad, 3 = Not very good, 4 = Good, 5 = Very good). After hearing the second protagonist explain the reasons for his belief, children were asked the Change question (“Now (the initial protagonist) has heard that, will he change his mind about (whether the mouse is in the red box)? To tell me whether (the initial protagonist) will change his mind you can use this pointer”). Again there were six possible responses (0 = Not sure, 1 = Definitely not change, 2 = Probably not, 3 = Might, 4 = Probably change, 5 = Definitely change).

Participants were then asked: “At this moment in time, is it okay for (the two protagonists) to think different things about the (mouse)?” (Diversity question), and to

justify their answer. Finally participants were asked the Truth question: “I want you to use the pointer to show me whether we can find out the truth about (where the mouse is.)”, and to select from the six possible responses (0 = Not sure, 1 = Definitely not find out, 2 = Probably not, 3 = Might find out, 4 = Probably find out, 5 = Definitely find out). Participants were asked to justify their response and any who said the truth could be found were asked, “How could we find out?” Child participants who said the truth about the biscuit could be found by trying it or through consensus were asked whether this would really lead to a true answer, for example “And if Dan liked it and Steve liked it, would that mean the truth is that the biscuit really is nice?”

Instead of using a pointer adults ticked the appropriate box on their questionnaire. To check that children understood how to use the pointer, prior to taking part in the experiment all the 6-year-old children took part in two warm-up tasks. In the first, children rated the reasons for a protagonist’s belief. In the second, they rated the likelihood that a protagonist would perform an action that was inconsistent with her beliefs. As the 6-year-olds proved adept at using the pointer, the warm-up task was not used with the 8-year olds.

### *Results*

Reliability of coding was checked by having a second person independently code a random sample of 21 transcripts, 7 from each age group (20% of transcripts overall). Out of 97 codings there was agreement in 95% of cases. All of the 5 disagreements were resolved by discussion (Cohen’s Kappa:  $K = 0.92$ ).

*Belief weightings.* The relative weight placed on fact- and preference-based beliefs in the two stories was assessed by combining responses to the Validity and Change

questions. For the ‘pure’ Mouse story it was expected that adults would see both fact-based beliefs as appropriate and therefore the belief weighting was calculated as the mean of Validity and Change ratings combined. For the ‘pure’ Biscuit story we expected adults to see an individual’s own preference as being of personal importance to them and unlikely to change in the face of someone else’s different preference. To reflect this, the belief weighting was calculated by subtracting the Change rating from the Validity rating. For the ‘contaminated’ disputes the rating awarded for the context-inappropriate belief was subtracted from the rating for the context-appropriate belief. For example, for the ‘contaminated’ Mouse story, when the initial belief was based on preference and the second on fact, the Validity rating was subtracted from the Change rating. When the initial belief was based on fact and the second on preference, the Change rating was subtracted from the Validity rating. The overall weighting awarded for fact-based beliefs for the ‘contaminated’ Mouse stories was then calculated for each age group. In the same way an overall weighting for preference-based beliefs was calculated for the ‘contaminated’ Biscuit stories. Participants who responded to either the Validity or Change question by saying “Not Sure” were omitted from the following analyses.

Belief weightings provided by the three age groups for the two ‘pure’ disputes were analyzed using separate one-way ANOVAs. For the Mouse story no age difference was found in weightings for the fact-based belief (6 yrs,  $M = 3.31$ , [ $SD = 1.31$ ],  $n = 8$ ; 8 yrs,  $3.73$ , [ $0.65$ ],  $n = 11$ ; adults,  $4.13$ , [ $0.83$ ],  $n = 12$ ). For the Biscuit story the adults ( $2.42$ , [ $1.08$ ],  $n = 12$ ) weighted the preference-based belief higher than the 8-year-olds ( $0.63$ , [ $1.30$ ],  $n = 8$ ) and the 6-year-olds ( $0.50$ , [ $2.76$ ],  $n = 10$ ):  $F(2,27) = 3.62$ ,  $p < .05$ .  $\eta^2 = .21$ .

Children were more likely to say someone would change their own preference after hearing about someone else's.

Belief weightings for the two 'contaminated' disputes were analyzed using separate univariate ANOVAs, with age and order (appropriate reason for initial or second belief) as between-subjects factors. For the Mouse story, weightings for the fact-based belief increased with age (6 yrs,  $M = 1.06$ , [ $SD = 1.70$ ],  $n = 18$ ; 8 yrs, 1.11, [1.20],  $n = 19$ ; adults, 1.88, [1.12],  $n = 24$ ):  $F(2,55) = 3.57$ ,  $p < .05$ .  $\eta^2 = .12$ . Planned pairwise comparisons showed differences between adults' and children's ratings did not reach significance ( $p$ 's  $> .05$ ). There was also a significant order effect, with weightings higher for the fact-based belief when it was presented first:  $F(1,55) = 26.22$ ,  $p < .001$ .  $\eta^2 = .32$ . For the 'contaminated' Biscuit story, there was a significant main effect of age,  $F(2,58) = 6.09$ ,  $p < .01$ .  $\eta^2 = .17$ ; with the adults (1.78, [1.38],  $n = 23$ ) weighting the preference-based belief higher than the children (8 yrs, 0.39 [1.56],  $n = 23$ ; 6 yrs, 0.33, [2.20],  $n = 18$ ), both  $p$ 's  $< .0166$  (adjusted for three comparisons). There was also a significant interaction between age and order ( $F[2,58] = 4.83$ ,  $p < .05$ .  $\eta^2 = .14$ ) with adults weighting the preference-based belief higher when presented first but 6-year-olds weighting it higher when presented second.

*Diversity question.* As expected on the basis of the previous literature, for both stories most of the participants in all age groups said at this moment in time it was okay for diverse viewpoints to be held (Biscuit: 6 yrs, 82% [27/33]; 8 yrs, 92% [31/34]; adults, 94% [34/36]. Mouse: 6 yrs, 85% [28/33]; 8 yrs, 88% [30/34]; adults, 69% [25/36]). The proportion of participants accepting diversity did not differ between 'pure' and 'contaminated' stories (Mouse;  $X^2[1, N = 102] = 0.07$ ,  $ns$ ; Biscuit;  $X^2[1, N = 102] = 0.05$ ,

*ns.*). For the Mouse story, 10 adults said it wasn't okay for the protagonists to hold different beliefs. Six of these responses occurred in 'contaminated' disputes where a protagonist had judged the location of the mouse on the basis of colour preference, which these adults saw as being invalid (although none of the children said this). Three other adults said it wasn't okay for different views to be held because the protagonists would need to know the truth to be sure their belief was correct.

Justifications for diversity were categorised as referring to: *i*) internal factors such as individual differences in personal preference, choice, or taste; *ii*) external factors such as available information or truth; *iii*) fairness or the possible consequences of disagreement and, *iv*) unclear or unelaborated responses. For each story we checked there was no difference in the justifications given for the 'pure' and the 'contaminated' disputes by comparing the frequency of external justifications given for the Mouse story ( $X^2[1, N = 103] = 0.03, ns.$ ) and internal justifications for the Biscuit story ( $X^2[1, N = 103] = 1.69, ns.$ ). Justifications for 'pure' and 'contaminated' stories were then combined and their distribution is shown in Table 1. To compare the proportion of appropriate justifications given by each age group, the frequency of external responses (Mouse story) and internal responses (Biscuit story) were compared with other categories of response combined. For both stories, the proportion of appropriate responses increased with age: Mouse,  $X^2(2, N = 103) = 6.10, p < .05. w = .24$ ; Biscuit,  $X^2(2, N = 103) = 12.43, p < .01. w = .35$ . To check whether participants within each age group differentiated between the Mouse and Biscuit stories, the frequency of internal and external justifications for diversity for the two stories was compared within each age group using 2 x 2 chi-square



tests. Amongst the 6-year-olds there was no difference in the frequency of internal or external justifications for the two stories but the 8-year-olds ( $X^2[1, N = 53] = 4.16$ ,  $p < .05$ .  $w = .28$ ) and adults ( $X^2[1, N = 68] = 21.40$ ,  $p < .001$ .  $w = .56$ ) tended to give internal justifications for the biscuit story and external justifications for the mouse story.

Hence, although participants at all ages accepted the legitimacy of diversity for both stories, adults and 8-year-olds acknowledged that the reasons for diverse views differed between the stories, whereas the 6-year-olds did not. Although adults' justifications for diversity clearly discriminated between the stories, for the Mouse story 39% (14/36) of the adults unexpectedly gave internal rather than external justifications such as "different people can think different things."

*Truth question.* There was no difference in overall Truth ratings for 'pure' and 'contaminated' stories: Mouse ( $t[94] = .86$ , *ns.*); Biscuit ( $t[92] = .18$ , *ns.*). 'Pure' and 'contaminated' ratings were then combined and Table 2 shows the mean Truth ratings for each story. Responses were analyzed using a mixed ANOVA with age, order and gender as between-subjects factors and story (Mouse x Biscuit) as a repeated measure. Nine participants were omitted (five 6-year-olds, two 8-year-olds and two adults) because they did not provide ratings for both stories. No main effects of gender or order were found and there were no significant interactions involving these variables so they were omitted from subsequent analyses. There was a significant main effect of story,  $F(1, 82) = 24.16$ ,  $p < .001$ .  $\eta^2 = .23$ ; and age,  $F(2, 82) = 4.42$ ,  $p < .05$ .  $\eta^2 = .10$ ; and a significant interaction between story and age,  $F(2, 82) = 12.03$ ,  $p < .001$ .  $\eta^2 = .23$ . Within age group comparisons of Truth ratings for the Mouse and Biscuit stories were carried out using three t-tests (adjusted  $p = .0166$ ). These showed that neither the 6-year-olds nor the 8-

year-olds discriminated between the two stories in the extent to which truth could be found, but the adults saw truth as being more likely to be found for the Mouse story than the Biscuit story,  $t(33) = 7.19, p < .01, d = 1.70$ .

For the Biscuit story there was a marked difference in how adults and children justified their Truth ratings. 67% of the 6-year-olds (19 out of 28) and 47% of 8-year olds (15/32), but only 18% of the adults (6/34) said a true answer could be found about whether the biscuit was nice or horrible, with almost all of these saying this could be done by tasting the biscuit. In a follow up question these children confirmed that this would reveal the truth. There was no such follow up question on the adults' questionnaire so we do not know whether the few adults who judged that the truth could be found would have given this final confirmation. Only 7% of the 6-year-olds (2/28) and 28% of the 8-year-olds (9/32) said the Biscuit issue was a matter of personal preference compared with 67% of adults (23/34). This contrasted with justifications for the Mouse story where participants of all ages were confident that the truth could be found about the mouse by discovering the content of the boxes (6 yrs, 75% [21/28]; 8 yrs, 72% [23/32]; adults, 88% [30/34]).

### *Discussion*

In general the adults responded as expected for both stories, seeing objective external information as important for the fact-based issue and emphasizing internal subjective factors for the matter of preference. This was true for both 'pure' and 'contaminated' stories. Fewer adults than expected referred to external factors for the fact-based issue, and instead some mentioned individual differences and personal opinions. These justifications (e.g. "Everyone is entitled to their own thoughts") may

have expressed a superficial acceptance of diversity as a phenomenon without any explanatory intent.

In line with previous work, most of the children acknowledged the possibility of diversity for fact- and preference-based stories. However, unlike the adults, the 6-year-olds often gave explanations for diversity that might be appropriate in other domains, talking about the consequences of disagreement or fairness. The difference between children and adults was most pronounced for the matter of preference. For the ‘pure’ and ‘contaminated’ Biscuit story children were less confident than adults in personal preference as a good basis upon which to hold a belief. For the ‘pure’ dispute the children appeared to see personal preference as more transient and open to change than did the adults. For the ‘contaminated’ story the 6-year-olds only appeared to recognize the relevance of the preference-based belief after first hearing the ‘inappropriate’ belief. Furthermore, in their answers to the Truth question neither the 6- nor the 8-year-olds discriminated between the Mouse and Biscuit stories and the 6-year-olds said the truth could probably be found about both. Taken together these responses indicate that the 6-year-olds, and to a lesser extent the 8-year-olds, did not attribute the same degree of legitimacy as adults did to subjective factors in the construction of beliefs. In Experiment 2 we included older children and young people to examine their explanations for diversity of beliefs and preferences and their views about its resolution.

## Experiment 2

In Experiment 2 we extended the age range of children tested to include four age groups: 7-, 9-, 11-, and 13-year-olds, with the aim of identifying the age at which children accepted the primacy of subjective factors for matters of taste. In Experiment 1 our

participants responded similarly to the Diversity and Truth questions for the ‘pure’ and ‘contaminated’ disputes. Here, therefore, we focused our attention on children’s judgments for ‘pure’ disputes only. We again used stories involving a hidden object (this time a coin) and personal preference, and we added two new stories involving an unknown cause. One of the new stories was about whether a fault in a video player or a television set was responsible for a teacher's inability to play a video to her class. The other was about the origin of a disease that affected two different kinds of animal. Like the hidden object stories, these described an issue about which people might hold different beliefs but about which an agreed upon truth could in principle be found. In contrast with the hidden object stories, however, the way of finding the truth was not obvious. In Experiment 1 children may have given adult-like responses to the fact-based story because they could easily identify how to find out the truth: The protagonists only had to open the boxes to locate the mouse. When the route to resolution was less clear, even though in principle there was a true answer, participants may have to draw upon a more abstract understanding of domains of knowledge, and there might be age-related differences which did not appear with the hidden object stories.

As in Experiment 1, we were interested in whether or not children assumed an objective truth could be identified for matters of taste, and in the extent to which they differentiated matters of taste from matters involving limited factual information.

### *Method*

*Participants.* A total of 96 children took part, 24 from each of 4 age groups (7-, 9-, 11-, and 13-year-olds). The 7-year-old group consisted of 11 males and 13 females (mean age 7 years 4 months; range 6;10 to 7;9). In the 9-year-old group there were 14 males and 10

females (mean age 9 years 4 months; range 8;10 to 9;9). There was an equal number of males and females in the 11-year-old group (mean age 11 years 4 months; range 10;10 to 11;9), and in the 13-year-old group there were 13 males and 11 females (mean age 13 years 5 months; range 12;11 to 13;9). The children were from 3 state-funded schools in a town in North Shropshire, UK. The children were drawn from a range of social backgrounds and all had English as their first language.

*Materials.* We used two sets of stories, A and B. Each set comprised one of the three types of story, personal preference, hidden object and unknown cause. The personal preference issues concerned a disagreement between two friends over whether a particular picture (set A) or a new kind of biscuit (set B) was nice or horrible. The hidden object issues were based on Carpendale and Chandler's (1996) ambiguous referential communication task in which the protagonists were in disagreement about where, out of two equally likely locations, a hidden coin might be found. Participants were presented with three cards representing a large red block, a large blue block and a small red block and heard protagonists receive an ambiguous message saying the coin was hidden under the large block (set A) or the red block (set B). The unknown cause story in set A described a situation at school in which the teacher wished to play a video tape to her pupils but found that this is not possible due to a fault in the equipment. The protagonists were two pupils who disagreed about whether the problem was caused by a faulty TV or video player. In the set B story protagonists disagreed about whether badgers or cows were the source of a disease that affected both animals.

*Procedure.* Half the children in each age group were assigned to receive the set A materials and the other half received set B. Order of presentation of the stories was varied

systematically so that within each age group and for each set of materials no one order was used more than twice. Each child, tested individually, was presented with a picture illustrating the story or was shown the relevant materials, and was told about the disagreement. Participants were then asked the Diversity questions followed by the Resolution questions. In what follows we give the wording for the personal preference stories. The question wording for the hidden object and unknown cause stories was similar.

The Diversity question was asked in two stages. First participants were asked, for example, “What might cause Bill to think the biscuits are nice and Peter to think they’re horrible?” then, “Does it make sense for Bill to think the biscuits are nice and for Peter to think they’re horrible? Is that okay?” Then, “Why?” Or “Why not?” Participants were then asked the Resolution question, “Can we decide whether Bill is right or Peter is right about the biscuits?” and asked to justify their response: “How can we decide who is right?” or “Why not?” For the personal preference stories only, when participants suggested the issue could be decided one way or the other, for example by consensus, by consulting a higher authority, or by finding out more about the issue, a final question was asked to probe whether they really did believe the truth could be found: “If we have a vote (consensus) and most people say the biscuits are nice, would that mean they really are nice?” or “If the teacher (higher authority) said the biscuits were nice, would that mean they really are nice?” or “If we (find out more) and we think the biscuits are nice, would that mean they really are nice?”

*Scoring the Diversity question.* Children passed the Diversity question (scoring one) for a personal preference story if, in response to any of the prompts, they gave an

appropriate internal explanation for the disagreement, for example “People have different tastes about different kinds of art work.” For the hidden object stories participants were scored as passing the Diversity question if they gave an appropriate external explanation, for example “You said the coin was under a red block and there are two red blocks...”, or if they said neither party was justified in holding to their views with any certainty as they couldn't possibly know the truth.

*Scoring the Resolution question.* For the Resolution question a score of one was awarded to participants who said the personal preference issue was a matter of (internal) taste, opinion, or individual choice. For the hidden object and unknown cause stories participants scored one by making appropriate references to external truth, saying the truth could be found, saying the matter could be decided by gathering more information or by reference to someone in authority, or saying the issue could not be resolved because not enough information was currently available.

### *Results*

Reliability of coding was checked by having a second person independently code a random sample of 18 transcripts, 3 from the youngest and oldest age groups and 6 from each of the two middle groups (19% of transcripts). Out of 144 codings there was agreement in 94% of cases. All of the 10 disagreements were resolved by discussion (Cohen's Kappa: Explanation question,  $K = 0.92$ , Resolution question,  $K = 0.90$ ).

To examine children's responses by age and story type, each participant was given three scores of between 0 and 2 according to the number of questions (Diversity, Resolution) answered appropriately for each of the three story types. There was no difference between scores for set A and set B stories, and no effects of gender. Scores for

the set A and set B stories were combined, and gender ignored, for subsequent analyses. Frequency of pass responses and mean scores for the three story types for each age group are shown in Table 3.

Scores were compared for the three story types using a mixed ANOVA with age as the between subjects variable and story (personal preference; hidden object; unknown cause) as the repeated measure. There were significant main effects of age,  $F(3, 92) = 8.67, p < .001. \eta^2 = .22$ ; and story,  $F(2, 184) = 3.43, p < .05. \eta^2 = .04$  but no significant interaction. Post hoc tests using Tukey's HSD showed there was no difference in the scores of the 7- and 9-year-olds for any of the story types, nor those of the 11- and 13-year-olds. Appropriate responses to the preference stories increased with age; one-way  $F(3, 92) = 11.91, p < .001. \eta^2 = .28$ . This was mainly due to a sharp increase in internal responses given to the Resolution question by the older children (7yrs, 25% [6 out of 24]; 9yrs, 37% [9/24] compared with 11 year olds 75% [18/24]; 13 yrs, 88% [20/24]). The extra probe for the Resolution question was asked of eight children in the 7-year-old group who said the truth could be found. Of these, six said "Yes" (the matter could be decided one way or the other) confirming their failure on the Resolution question. Two of the 9-year-olds, and one of the 11-year-olds also said the truth could be found. For the two fact-based stories the more remote possibility of resolution for the unknown cause story did not influence children's justifications. Although appropriate external justifications increased with age ( $F[3, 92] = 3.89, p < .05. \eta^2 = .11$ ) there was no difference in responses to the hidden object and unknown cause stories and no interaction. A surprising number of the older children did not give an appropriate external response to the Diversity question for the fact-based stories (hidden object: 11-year-olds,



42% [10/24]; 13-year-olds, 45% [11/24]; unknown cause 11-year-olds, 33% [8/24]; 13-year-olds, 38% [9/24]). Most of the 13-year-olds who failed this question gave internal justifications for diversity. For the hidden object and unknown cause stories combined, 70% of the 13-year-olds' fail responses to the Diversity question [14/20] involved talking about individual differences and opinions (7 yrs, 20% [5/25]; 9 yrs, 37% [10/27]; 11 yrs, 33% [6/18]) rather than giving irrelevant responses, or simply saying they didn't know.

### *Discussion*

As in Experiment 1, the younger children construed personal preference issues differently from the older participants. As before, even the youngest children acknowledged the possibility of diverse preferences, and with deeper probing here the 7- and 9-year-olds usually located the source of diversity internally within the protagonists. However, in line with the findings of Experiment 1 they were less likely than the older children to state that these issues might not be resolvable. In the youngest group some children said that further information would be sufficient to resolve the disputes or confirmed that if a consensus view were achieved this really would be the true view. In contrast the 11- and 13-year-olds were more likely to judge the personal preference issues as unresolvable. The older participants, but not the young ones, appeared willing to accept that beliefs based upon personal likes and dislikes, can legitimately be held by individuals independently of any external truth. This indicates that an awareness of how subjective processes influence the construction of knowledge and beliefs continues to develop over this period.

Even though the older children were more confident about whether or not the issues could be resolved, like the adults in Experiment 1, many failed to mention external factors in their explanations of the objective issues. Instead, these participants focused on

the personal opinions of the protagonists rather than the limitations in the input when asked to account for different interpretations. Perhaps they tried to explain why the protagonists held one belief rather than another in the absence of any rational reason to do so. Presumably the participants themselves accepted the validity of both possible interpretations of the limited information, and they might assume that any rational protagonist would do the same rather than opt for one interpretation. Another possibility is that in early adolescence people become particularly aware of the mark individual minds can make when interpreting input, and pay special attention to idiosyncracies of belief (see, for example, Chandler, Boyes, & Ball, 1990; Chandler, Hallet, & Sokol, 2002).

#### General Discussion and Conclusions

We examined the nature of young children's understanding of the role played by subjective processes in the construction of beliefs. Our findings go against the assumption of precocious understanding of subjectivity (Carpendale & Chandler, 1996; Flavell, Flavell, Green, & Moses, 1990), and add to the evidence that understanding of subjectivity demonstrated by 6- to 9-year-olds is rather shallow and qualitatively different from that of the adolescents and adults (Clinchy & Mansfield, 1985; Mansfield & Clinchy, 2002; Wainryb et al., 2004)).

Our results also fit with the results of studies which identify a key shift in children's thinking as they move to adolescence, when they come to accept the contribution of internal subjective factors in the construction of knowledge and beliefs (e.g. Chandler, Boyes, & Ball, 1990; Mansfield & Clinchy, 1997; Schwanenflugel, Fabricius, & Noyes, 1996). Although most of our child participants accepted that people

can like different things they were less likely than adults to accept personal preference as a legitimate reason for holding a belief about a matter of taste. For the ‘contaminated’ disputes in Experiment 1, 6- to 8-year-old children did not discriminate in the same way as adults to identify appropriate reasons for beliefs, particularly in the domain of personal taste. In Experiment 2 some children, mainly 7-year-olds, said it was possible to determine whose preference was correct. Most 11- and 13-year-olds, on the other hand, treated external truth as irrelevant to disputes about personal taste. In contrast to the age-related differences seen for the preference-based stories, in both Experiments 1 and 2, there was much more similarity across the age range in responses about the fact-based stories.

In Experiment 1 when asked to justify their answer to the diversity question, in both domains the younger participants often imported ideas more appropriate for discussing issues of morality or friendship. One possibility was that 6-year-olds in particular found the justification tasks too linguistically demanding, and that we therefore gained a misleading impression of their level of understanding about subjectivity. We think this unlikely since, as Carpendale and Chandler (1996) point out, for matters of preference the acceptable adult response is usually a very simple one which amounts to saying that it’s okay for different views to be held because people are different or because people like different things (e.g. Mansfield & Clinchy, 2002). It would have been much easier for the youngest children to produce this kind of response than the often convoluted explanations seen here.

On the other hand the accepted justification could be given without reflection on the underlying nature of the diversity in question. In Experiment 2, since no reasons were

given for protagonists' different views, it may have been particularly easy to say 'People are different' or 'They have different minds', and most 7-year-olds did so. In Experiment 1 in contrast, participants were told the reasons for each protagonist's belief (e.g. "The reason Dan thinks the biscuit is horrible is that he doesn't like the taste of those biscuits."). This might have led participants to reflect on the nature of the disagreements and, having done so, the responses given by the younger participants could have been more revealing of their uncertainty about using subjectivity as an acceptable explanation for diversity.

Acknowledgement of diversity is only the starting point for diagnosing understanding of the balance of objective and subjective in different domains of knowledge. In Western cultures, adults judge that for matters of preference there may be no externally validated truth, whereas for matters involving ambiguous information in principle at least the truth can be identified. More generally, adults judge that external information plays a more important role in the formation of beliefs about matters of fact than about matters involving personal preference. The results presented here suggest it is invalid to interpret children's acceptance of diversity ("Both views can be right") as indicating adult-like understanding of subjectivity. Here we asked about a very limited range of issues about which we were reasonably confident adults would agree on the extent to which subjective and objective factors were important. In future, however, it is necessary to probe more deeply into participants' understanding of the different reasons for diversity in a wider range of domains.

When acknowledgement of diversity is taken as the sole indication of understanding subjectivity, children as young as 7 or 8 years appear to take an adult-like

relativist position for matters of taste (Kuhn et al., 2000) and for matters of taste and ambiguous fact (Wainryb et al., 2004). In other knowledge domains, relativistic thinking has usually only been identified in older age groups. This has led to the suggestion that epistemological development is recursive, particularly in the development of an understanding of how subjective processes are involved in the construction of beliefs (Chandler, Hallett, & Sokol, 2002). According to this explanation, an adult-like understanding of subjectivity is likely to be demonstrated first on a case-by-case basis for single issues such as matters of preference. Chandler et al. (2002) propose that, as a natural off-shoot of the development of formal-operational thinking during adolescence, the individual comes to realise that all knowledge is inherently subjective in nature. As a result the relativistic approach to beliefs taken initially only for matters of preference will now be revisited and re-applied in a wider range of knowledge domains. The findings presented here do not fit with the notion of recursion, however, as even in the domain of personal preferences the understanding of subjectivity demonstrated by many of the 6- to 9-year-olds was limited in comparison to that of the young adolescents and adults. The age-related difference in responses seen here is better characterised as representing the difference between shallow and deep knowledge about subjectivity. Although most children were aware that people can have different preferences, we suggest it is only when individuals come to a deeper understanding of the relationship between subjectivity and truth that they can be said to be taking a relativist position or to be fully aware of the constructive nature of the knowing process.

The differences in performance seen here in children and adults could be accommodated by Kitchener's (2002) explanation for context-relative epistemological

thinking. Kitchener's account is based upon Fischer's (1980) notion of functional and optimal skill levels, where functional refers to the individual's typical level of thinking. Optimal level depends upon neurological development, and represents the highest level of reflection of which the individual is capable. The individual's level of performance on any task is construed as situated on a continuum, falling somewhere between functional and optimal depending upon factors such as their domain specific knowledge, practice, and available support. According to this explanation we might expect children's performance to be limited in comparison to adolescents' and adults' at both the optimal level, in terms of underlying cognitive abilities that develop with age, and at the functional level due to experiential factors. We would also expect to see individual differences in the responses of adults, particularly where there are differences in their experience of reflecting upon and reasoning about knowledge and beliefs.

This fits with the findings of studies linking the experience of higher education to the presence of higher level epistemological thinking (e.g. Kuhn, 1991; Kuhn & Weinstock, 2002; Perry, 1970). The adults who took part in the current study had returned to college after a break from compulsory education and they had no experience of higher education. Such adults, with little or no experience of post-compulsory education, are comparatively under-researched in the literature. The finding that a small number of them said the truth could be found about a matter of preference, cautions against making untested assumptions about how ordinary adults construe knowledge. It would be interesting to examine the relative weight given to subjective factors for more complex issues than those presented here by adults with diverse educational backgrounds.

To summarize the implications of our findings: The claim that children as young as 3 or 4 years old understand about personal preference, ignores the extent to which an understanding of subjectivity may remain to be worked out during later childhood and possibly beyond. Central to this understanding is the ability to assess the relationship between subjectivity and truth. When asked about simple matters of fact, young children responded in a similar way to adolescents and adults. For matters of preference, in contrast, children were less likely to acknowledge subjective factors as a legitimate basis for belief and more likely to say a single truth could be found. Although for the simple matters of preference presented here most of our adolescents responded like adults, explaining diversity by referring to internal factors and saying the truth could not be found, we suggest that mastery of this domain represents only one staging point on in the ongoing process of learning to balance the relationship between subjectivity and truth across a range of different knowledge domains.

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Table 1.

*Justifications for diversity judgments for the Mouse and Biscuit stories by age (percentages).*

	Mouse			Biscuit		
	6-yr-olds	8-yr-olds	Adult	6-yr-olds	8-yr-olds	Adult
	n=33	n=34	n=36	n=33	n=34	n=36
Internal	39	53	39	53	67	92
External	28	25	53	17	6	6
Fairness or Consequences	19	8	0	19	17	0
Unclear or unelaborated	14	14	8	11	11	3

Percentages may not add up to 100 due to rounding.

Table 2.

*Mean (SD) ratings for likelihood of finding out the truth about the Mouse and Biscuit issues (1 = definitely not find out, 2 = probably not, 3 = might, 4 = probably find out, 5 = definitely find out).*

	6-yr-olds	8-yr-olds	Adults
Mouse	4.11	3.88	4.71
	(1.20)	(1.01)	(.76)
	n=28	n=32	n=34
Biscuit	4.04	3.25	2.65
	(1.32)	(1.34)	(1.54)
	n=28	n=32	n=34

Table 3.

*Frequency of pass responses for the Diversity and Resolution questions and total mean scores (SD) for each age group by story type in Experiment 2.*

Story	Question	7-years (n=24)	9-years (n=24)	11-years (n=24)	13-years (n=24)
Personal	Diversity	18	22	23	24
preference	Resolution	6	9	18	20
Mean personal preference score (sd.)		1.00	1.29	1.71	1.83
(min 0 – max 2)		(.72)	(.55)	(.46)	(.38)
Hidden	Diversity	11	8	14	13
object	Resolution	15	19	22	22
Mean hidden object score (sd.)		1.08	1.13	1.50	1.46
(min 0 – max 2)		(.78)	(.68)	(.59)	(.51)
Unknown	Diversity	12	13	16	15
cause	Resolution	15	14	19	20
Mean unknown cause score (sd.)		1.13	1.00	1.46	1.46
(min 0 – max 2)		(.74)	(.78)	(.66)	(.72)